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ADMINISTRATOR FOR AUTOMATICALLY ADAPTING A TRANSMISSION  
CHANNEL

The present invention relates to a method for exchanging data using a wireless connection, a user having one or more portable terminals being located in the transmission and reception range of at least one network, the terminal or  
5 terminals automatically logging on to the network in order to establish a connection, and a transmission channel being made available for the data exchange within the framework of the connection established in each case. The present invention is also directed to a system for implementing the method.

10 Depending on a user's exact whereabouts, more or fewer possibilities are available to him for exchanging data via wireless connections. More often than not, the user is in the service area of GSM [Global System for Mobile Communications] networks for mobile telephony, while short-range radio  
15 communications networks such as Bluetooth or WLAN [wireless local-area network] are only available to him on certain occasions.

The exchange of large volumes of data is generally associated with different expenditure in terms of transmission time and  
20 cost, depending upon the type of connection usable at the moment. For this reason, the user has an interest in waiting with the download of an MP3 data file, for example, until he gets into the Internet via WLAN. He will not want to retrieve the data file via GSM. Thus, the user will wait until the  
25 terminals he is carrying with him get into the service area of a distributor or access point which provides them with access to external networks via a local network. So-called "cafe computing" would be a special exemplary embodiment of such

local networks. It is based on the already established  
concept, according to which a user goes into a cafe, for  
instance, opens his laptop, logs wirelessly (e.g., Bluetooth)  
onto the local network of the cafe via an access point, and  
5 answers E-mails or surfs the Internet while enjoying a  
cappuccino. Located next to him is also his cellular phone,  
with which he telephones via GSM, or exchanges SMS [short  
messaging service] messages.

When working with such devices, it is again disadvantageous  
10 that a maximum bandwidth is reserved for each unit logged onto  
the cafe access point, even if the user needs only a little  
capacity at the moment. Consequently, resources are wasted  
unnecessarily for relatively modest requirements. From the  
cafe operator's point of view, this is unsatisfactory, since  
15 resources which he could profitably offer to other users are  
being blocked.

The object of the present invention is now to provide a method  
for data exchange within the framework of such concepts, which  
may easily be implemented by cost-effective means, and which  
20 automatically ensures efficient distribution of the available  
resources, accompanied by great ease of operation, and which  
therefore contributes to an increase of acceptance.

These objectives are achieved by the method having the  
characterizing features of Claim 1, and by the system as  
25 recited in Claim 10.

The background of the invention lies in recording the  
whereabouts of a user and his respective terminals and,  
depending on the whereabouts, automatically making available  
to him the connections that are possible there, and have the  
30 capacity needed for the data exchange. This adaptation relates  
to the type of terminal or terminals and the type, especially  
the quantity, of data waiting for transmission. It is

accomplished automatically by the administrator assigned to the network.

The present invention is able to manifest on two levels. Thus, the user, having his terminals, may stay at one location,

5 e.g., in the area of a cafe access point, over the duration of the connection. The result of the inventive method is that the administrator assigned to this "internal" network then makes an optimized connection available to the user. On the other hand, in a superordinate level of the method, the movement of  
10 the terminals across the boundaries of networks is monitored, and depending on the whereabouts, connections are produced to the networks established there. The user is thus able to move freely, while the system takes care that he is able to accomplish his data transmission, in each case under optimized  
15 marginal conditions, particularly with respect to costs, security and/or transmission performance. Among the channels available, that one is selected which is suitable for fulfilling the task, this channel moreover being adjustable in its transmission capacity. Thus, the administrator assumes the  
20 function of a router which automatically selects the best possible transmission path. It can also be advantageous if the user is able to predefine priorities.

To implement the method within the framework of a local network, e.g., in a cafe, a permanently installed device is  
25 advantageously used as administrator, the portable terminal gaining access to an external communication network, particularly the Internet or a telephone network, via the administrator. In this case, the connection between the terminal and the administrator is established via a short-  
30 range radio communication network, especially Bluetooth or WLAN.

Thus, according to the present invention, the available  
possibilities and resources are adapted flexibly to the  
instantaneous requirements. In order to accomplish this, in  
one advantageous specific embodiment, first of all the type of  
5 portable terminals to be assigned to a user, as well as the  
type of data waiting to be transmitted are ascertained. On the  
basis of the conditions thus ascertained, one connection is  
then selected from a plurality of connections available.  
Ultimately, the connection is established and cleared between  
10 the distributor and the portable terminal.

Moreover, it is advantageous if usage of the local network is  
possible with different terminals. Thus, it is unimportant  
what communication device the user entering the cafe is also  
carrying with him. He is able to make use of a PDA, a laptop  
15 or a BlackBerry. According to the present invention, the  
communication with the terminal is possible via the wireless  
network of the cafe, without an external provider, accompanied  
by additionally accruing costs, being needed. The  
administrator obtains the information, transmitted or detected  
20 automatically, as to what devices are available to the user,  
and selects one of the devices and the type of connection  
optimized to the data.

As already explained, it is advantageous if the administrator  
selects the bandwidth (capacity) as a function of the amount  
25 of data to be transmitted.

The greater the quantity of data waiting, the greater the  
bandwidth it will select, in order to attain a comfortable  
transmission rate. In selecting the bandwidth, the  
administrator will orient itself to how high the overall load  
30 is at present, and what total transmission duration at most it  
may probably expect of the user. In this context, depending on  
the direction of the data transmission, the need may be

ascertained automatically or by a message sent in advance. In the case of transmission to the terminal, by analysis, the administrator is able to learn the type, particularly the extent and the transmission standard, of the data waiting on its side for transmission. For instance, if it determines that it is a larger MP3 file, it will make a WLAN connection having higher bandwidth available, while for a small E-mail, a Bluetooth connection with low bandwidth is preferred, for example.

10 If the intention is to transmit from the terminal to the administrator, it is advantageous to first send a brief message about the type of data waiting on the side of the terminal, in a kind of header. Based on this information, the administrator is able to set up an optimal connection. In this context, it is advantageous if each terminal permits the user to define certain usage profiles in advance. Based on the usage profiles, the device ascertains the bandwidth probably needed, and relays this, particularly via the header, to the administrator. Therefore, each device within the reception radius has made available to it only the bandwidth it is anticipated to need. In one advantageous specific embodiment, it is possible for the distributor to change between bands in the course of a connection, depending upon the requirement. For example, the subject of the fetched E-mail could be sent via Bluetooth, and the annex via rapid WLAN. The user will not notice the switchover between the connections on his laptop. Such a change also exists when information about the type of data that are following is initially exchanged via a first band, before the data are exchanged via another band adapted to the type.

It is also advantageous if profile data, which bring about a prior determination of tasks to be accomplished, are predefined to the system. Consequently, the terminal is able

to undertake a specific transmission automatically, as soon as it is located in the reception range of an administrator, and without the user having to repeat this process himself each time.

5 This type of "flexible" interface according to the present invention offers various advantages: Thus, by the definition of this interface standard, which permits an adjustment of various profile data of individual devices and users with the administrator, it is possible to optimally organize specific  
10 bandwidth requirements, while at the same time, a convenient automation of services is ensured. For the user, the invention offers a high degree of convenience, since many steps are carried out in automated fashion. For the operator of the local network, who makes a profit at the location where the  
15 service is made available, it is advantageous that his network is optimally utilized, thus maximizing earnings.

The present invention is elucidated in the following, using an exemplary embodiment.

In the example, the user has a laptop and a cellular phone  
20 which includes organizer functions. The laptop he uses substantially privately. On a suitable Internet page, he has found software offers of interest to him, and has assembled them for the download. For time reasons, however, he wants to undertake the actual download only when a certain downstream  
25 bandwidth is available to him. He uses the cellular phone professionally for managing E-mail and appointments. In his user profile, he has specified to undertake a synchronization with the corporate network as often as possible. To save time, however, he has only the subject lines of the individual  
30 messages transmitted, in order to be able to sort out unimportant messages.

If the user now enters a cafe which makes a wireless access point available, his devices perceive this independently. They establish the necessary connection autonomously, taking into account the bandwidths required, and fulfill the tasks set  
5 beforehand. While the laptop undertakes the notified download with the greatest possible bandwidth, the cellular phone reserves for itself only a small bandwidth, e.g., of the Bluetooth connection, and synchronizes itself automatically with the corporate network. The services therefore follow the  
10 user, without him having to reactivate and configure them in each instance.

The method of the present invention is implemented using an administrator which has a first interface to an external network, especially the Internet and/or a telephone network,  
15 and a second interface to a local network, via which a short-range radio link, suitable for the data transmission, is able to be established to a terminal present in the transmission and reception range. In addition, the administrator has a router module, realized in particular by a computer program,  
20 which determines the type of data waiting for transmission, and establishes a connection, corresponding to the type, to a terminal. This connection is optimized in light of the terminal available, the costs and/or the transmission speed.